

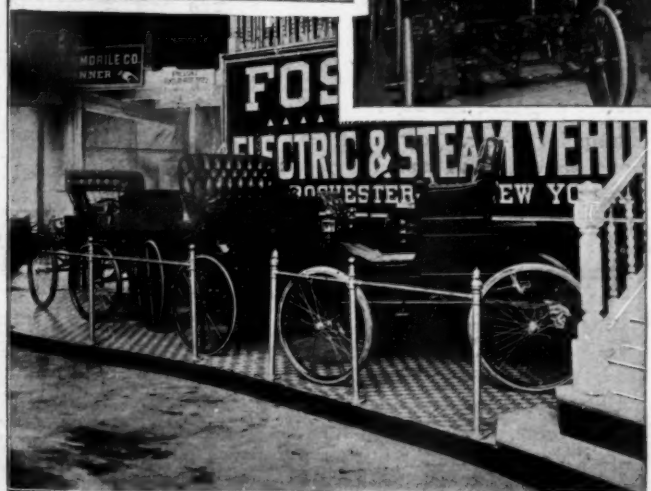
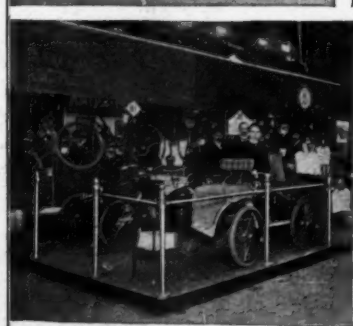
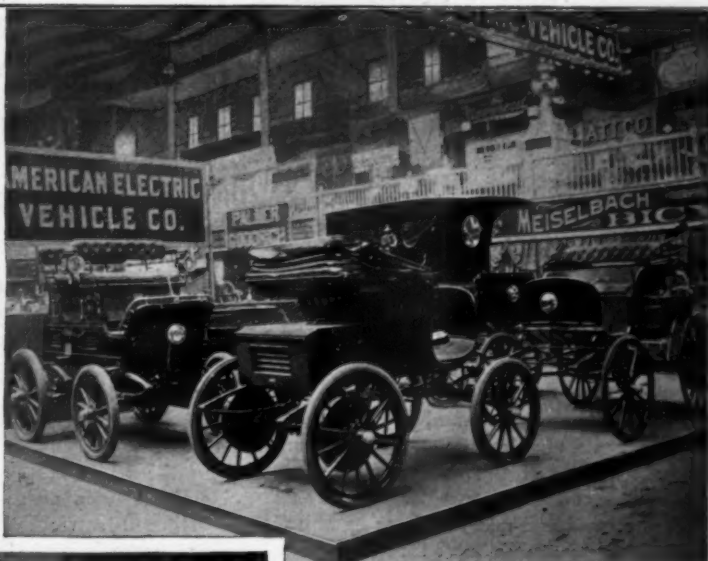
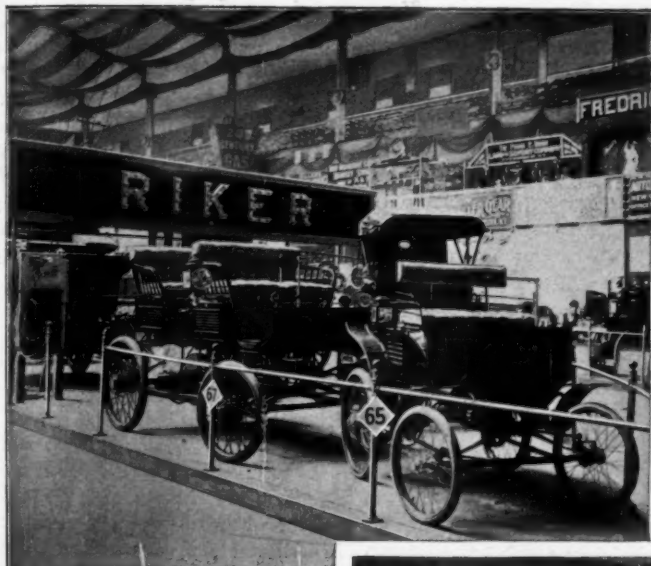
The Automobile

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1. Riker Automobiles.
3. Canda "Auto-quadracycles."
5. Foster & Co.'s Automobiles.

4. Regas Exhibit.

2. American Electric Automobiles.
5. Oakman Automobiles.
6. Waverley Automobiles.

AUTOMOBILE EXHIBITS AT THE NEW YORK SHOW.

Automobiles at the New York Show.

The show held last month at Madison Square Garden, New York, in the interest of bicycles and automobiles, while largely taken up with the former, presented a greater number and variety of automobiles than any previous show held in this country. The number of builders exhibiting was nearly three times the number at the electrical show last spring. Eight companies exhibited electric vehicles; five companies exhibited gasoline and two companies exhibited steam automobiles. A total of thirty-five vehicles were shown, of which twenty-one were phaetons or runabouts, two brakes, one surrey, one theatre bus, one demi-coach, one cab, five delivery wagons, two "autoquadricycles," and one steam pacing tandem. One company exhibited electric motors, controllers and vehicle running gears, quite a number wheels, bearings, lamps, etc., and many accessories were either exhibited or representatives were present to distribute information.

While many bicycle firms had displays in commodious quarters at several of the hotels, automobile builders found space at the gardens more satisfactory. The early applications secured the best spaces, and late comers were left with only the least desirable corners, and in several instances were unable to get space at all. Representatives of the companies present reported that a large number of automobiles were sold, and many of those exhibited were sold to be delivered at the close of the show. It was an excellent opportunity for the purchasers of automobiles to compare the vehicles as to their design, appearance, etc.

A number of the larger builders of automobiles and some who are credited with the largest sales of self-propelled vehicles were conspicuous by their absence. As far as could be learned, no representative of these companies attended the show, and the opinion of their managers was that other methods of advertising and acquainting the public with their automobiles were more satisfactory. The mixing of the bicycle and automobile exhibits was unfavorably commented on by many, and it seemed to be the opinion of many that had a certain section of the building been reserved for automobiles the exhibits could have been shown to better advantage.

Although but a small percentage of the builders of automobiles were represented, the development of the industry is clearly shown. The gasoline vehicles shown were of the light runabout type, and no heavy carriages were displayed of this kind. In electric automobiles the greatest variety was shown. Both light and heavy deliveries, light runabouts, traps and brakes were exhibited. Steam automobiles of the light stanhope style, with the exception of a pacing tandem, were the only ones

shown. Several makers exhibited their products for the first time at this show, having been quietly perfecting their motors for some time.

The Exhibits.

To the left of the entrance of the great building on one of the main central aisles the visitor found the exhibit of the Indiana Bicycle Co., the maker of the Waverley automobiles. The name was very conspicuously presented on the illuminated signs, which did not catch the eye more quickly than the beautifully finished vehicles shown in the space below. The mail phaeton, brake and some of the automobiles have been illustrated in these columns, but the Newport brake, finished in yellow wicker work and a combination of dark green and red body and red running gear, was probably the greatest novelty. It is fitted with a six-horse power motor and a battery that will drive it over thirty-five miles of road. The total weight is about three thousand pounds. It is most complete with electric side lights, compartments for carrying lunch, etc., etc. The light delivery wagon, a combination vehicle which can be changed, by removing top and substituting a rear seat, into a two-seated pleasure carriage, also attracted attention. Mr. F. M. Hoblitt and R. H. Hassler represented the company at the show.

To the right of the main entrance on one of the main aisles was the exhibit of the Riker Electric Vehicle Co. The nine spaces were crowded with automobiles, and Mr. Adams, the representative of the company, was always occupied by a stream of visitors. A switchboard with rheostat and meters occupied a corner of the space, and served to illustrate the method of charging the battery and also to replenish those of the vehicles exhibited. The exhibit included runabouts, delivery wagons, theatre bus, demi coach and a surrey. This extensive display served to show a variety of carriages, on each of which special designs of the various parts were evident. Both steel and wood wheels were shown. Pneumatic tires on lighter automobiles, and solid tires were used on the heavier ones.

These automobiles were all electric, equipped with the Riker multipolor motor. The size, from less than one kilowatts to more than five kilowatts, ranging according to the size of the vehicle, it is to propel. The batteries have a potential from 80 to 96 volts, and a current capacity from 60 to 200 ampere hours depending on the vehicles on which they are used. The batteries are scarcely in evidence on these automobiles, and in this respect this exhibit showed a great advance over the earlier electric automobiles that were brought out. Both single and double motor equipments were used.

Another exhibit of automobiles on the main promenade was that of the American

Electric Vehicle Co., whose factory has recently been moved to Hoboken, N. J., with a New York office. These vehicles were all of the electric type, and were shown to good advantage under the direction of Mr. C. E. Corrigan, general manager of the company, and H. G. Osborne. Only a few of the many designs of automobiles built by the company were represented in this exhibit. These, however, served to show the equipment which has been brought out by this company. The electric motor has been designed with special reference to automobile driving, and the improved form of storage battery has been developed for a similar purpose. Different sizes of equipments are built for the different styles of vehicles, giving varying power and speed. A runabout, phaeton, brake and delivery wagon were exhibited.

Not far from this exhibit the General Electric Automobile Co., of Philadelphia, had an electric runabout on exhibition. It had a removable dos-a-dos seat, so that the carriage would accommodate either two or four persons as desired. Wooden wheels, solid rubber tires, double motor equipment with a battery capacity of 80 ampere hours, were some of the features of this vehicle. The mileage capacity is from thirty to thirty-five miles, and the controller gives five speeds, three forward and two backward.

The Regas Vehicle Co., of Rochester, N. Y., had on exhibition three automobiles built by the Wood's Motor Vehicle Co., of Chicago, for whom they are sales agent. These were all electric, very stylishly gotten up and very finely finished. A runabout, stanhope and a delivery wagon were shown. Unfortunately, the space secured was a corner one, and the exhibit was not seen to its best advantage. A goodly crowd was always to be found at this space, and the representatives of the company undoubtedly had their hands full.

An exhibit that had been looked forward to with a great deal of interest was that of Foster & Co., of Rochester, N. Y. For some time it had been reported that this company was preparing to turn out a line of high-grade automobiles, and therefore the interest in these carriages brought a large crowd to the space even before the carriages had been placed. Three automobiles of the stanhope pattern were exhibited. Two of these were steam vehicles, and the other electric. The general design of the carriages was especially pleasing, and the running gear and mounting of the driving mechanism had been accomplished with great skill. Space here will scarcely permit a full description of either style of automobile.

The Elgin Automobile Co. had on exhibition two runabouts, one an electric and the other a gasoline. This line of automobiles has been styled the "winner," and are quoted at very low prices. The company occupies the old Elgin wheel factory,

and the company is actively pushing its product.

The Eddy Electric Mfg. Co., who has had a long established reputation as a builder of electric motors, had automobile motors, controlling devices, and a complete running gear, which served to show the line of automobile goods being manufactured. The company has entered this field, one of the first to undertake this line, and has a very complete equipment for electric automobiles.

Among the gasoline automobiles shown were the light runabouts of the Oakman Motor Vehicle Co., who had three of these on exhibition. A description of this vehicle was given in the last issue of this paper.

The Loomis Automobile Co. had a very

wheels of a cab, the idea being that it can be substituted by a few changes for the forward wheels of any horse vehicle.

It was a surprise to many not to find a number of motorcycles and pacing machines at the show. The only thing of this kind shown was the steam pacing tandem bearing the Stearn's colors. It was a "yellow fellow" on a large scale.

Accessories.

Vim tires for automobiles were as conspicuously displayed by the Boston Woven Hose & Rubber Co. as the lighter bicycle tires. The company has been long in the business, and the name Vim is well known.

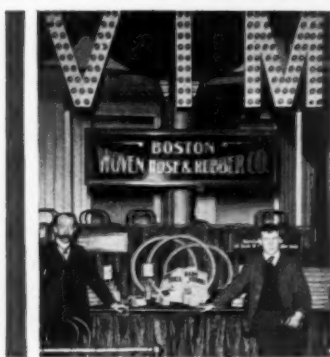
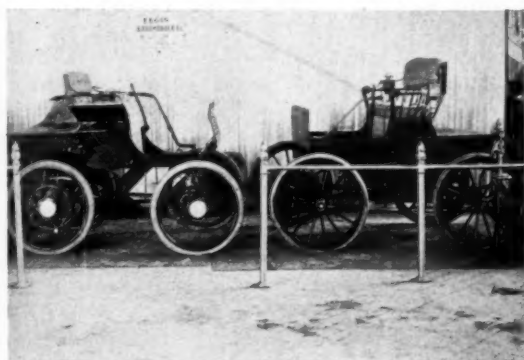
A novelty for vehicle tires was shown

The American Roller Bearing Co. had a very neat display of bearings. Several wheels fitted with these bearings were shown, and the sight of a wheel running for hours after being started was very convincing as to the frictionlessness of these bearings.

The Manufactured Rubber Co. displayed the Ducasble tire as applied to heavy wheels by showing the wheels complete, and also the separate tires.

Graphite for chains, motor cylinders, bearings of all kinds was presented by the Joseph Dixon Crucible Co., of Jersey City. Mr. J. H. Baird was present to present graphite's claims for recognition.

The display of Kelly "wired on tire" for vehicles, made by the Consolidated Rubber Tire Co., was interesting to vehicle



1. ELGIN AUTOMOBILES.

4. KELLY TIRES AND GRANT ROLLER BEARINGS.

2. DUCASBLE TIRES.

5. VIM TIRES.

3. DUNLOP TIRES.

6. RIKER AUTOMOBILES.

AUTOMOBILE EXHIBITS AT THE NEW YORK SHOW, Continued.

light gasoline runabout. Its weight complete was a little over 300 pounds. Being light and neat appearing, it naturally attracted a considerable attention. Mr. Loomis was on hand with literature describing the vehicle.

Two "autoquadricycles" were exhibited by the Canda Mfg. Co., of Carteret, N. J. These were the only thing of the kind at the show, where it was expected there would be many gasoline cycles and quadricycles shown. For a complete description of this vehicle see the January number of THE AUTOMOBILE.

Another novelty at the show was a German invention which is being introduced in this country by the Automobile Fore-carriage Co. This is a gasoline motor and appliances mounted on the forward

by the Metallic Rubber Tire Co. in the shape of a tread for tires. This is placed over the pneumatic tire, and is claimed to be 98 per cent. puncture proof.

The American Dunlop Tire Company had a very instructive display of vehicle and automobile tires. The method of manufacture in order to give strength and durability to the tire was shown by the parts of tire. The improved form of tire was exhibited having the wide lap on the inner edge.

The B. F. Goodrich Co. had an attractive display of tires and a full corp of representatives to explain their merits. The Goodrich pneumatic carriage tire is extensively used on vehicles. The Bailey "won't slip" pneumatic carriage tire is another product of the company.

users. The method of putting on this tire and of keeping it there was very conclusive.

The Diamond Rubber Co. displayed the light and heavy patterns of vehicle tires. Messrs. Randolph and Woodward represented the company.

Pumps were the main feature at the space of the Gleason-Peters Air Pump Co. An elaborate display of all kinds of air pumps was made for light and heavy use up to 400 pounds pressure.

Among other exhibits of interest to automobilists were those of the Badger Brass Mfg. Co., lamps; The Grant Axle & Wheel Co., roller bearings, wheels of a New York fire department truck being shown; The 20th Century Lamp Co., lamps, and The Preston Hose & Tire Co., tires.

Club News and Views.

Automobile Club of Baltimore.

An organization of the automobilists of Baltimore is now under way. At the preliminary meeting, held at the office of the Automobile & Mfg. Co., on Feb. 3d, twelve automobilists were present. Mr. T. P. Amoss was appointed chairman, and Mr. W. W. Donaldson secretary pro-tem. The committee to prepare constitution and by-laws is composed of Mr. Amoss, chairman; Mr. W. E. Hooper, Mr. M. Gillett Gill, and Mr. Donaldson.

As soon as the committees are ready to report a meeting for permanent organization will be held, officers elected, constitution adopted and plans for the promotion of the automobile in Baltimore taken up. The club will cooperate with other organizations for the improvement of the public road, and special efforts will be made to improve the road conditions about Baltimore.

An automobile run or parade is talked of, to be arranged at an early date. This will help to show the magnitude of the industry in this city, where there are a number of builders of self-propelled carriages.

Club Lectures.

The first of a series of papers on subjects relative to the automobile was read before the Automobile Club of America at its quarters in the Waldorf-Astoria on Saturday evening, Jan. 27. This paper was "The Gas Engine, as Applied to Automobiles," by A. Fischer. On February 10th, Mr. A. L. Riker is to read a paper on "Electric Automobiles," and on February 17th, Mr. J. A. Kingman is to present a paper on "Steam Automobiles." Other papers will be arranged for and will be announced later.

Luncheon at the Club House.

On Saturday last, January 27th, some twenty members of the Automobile Club of America ran out from New York city to the new country club house for luncheon and returned in the early evening to the city. Those who went were A. C. Bostwick and E. F. Girrot, George F. Chamberlin and A. B. Strange, Dr. E. C. Chamberlin and Herbert Carpenter, Alexander Fisher and Fred Nagle, J. Wesley Wilson, George Curtis, Jr.; F. J. Crolus and J. R. Carter, Whiting Lyon and A. R. Riker, George J. Scott and J. Dunbar Wright, Winslow E. Busby and A. Morris and David Wolf Bishop, Jr.

Unfortunately, the day was unusually wintry and a strong wind was blowing. The ride out to Kingsland Point, which on a warm day would have been most delightful, presented on this occasion little protection from the wind. The warm

fireside at the club was all the better appreciated after the ride, and when lunch was served appetites were the keener.

Standing Committees for 1900.

The following committees have been appointed for the Automobile Club of America by its board of governors for the present year:

Runs, Tours, Contests and Exhibitions.—Albert C. Boswick, A. R. Shattuck, D. W. Bishop, Jr., J. C. McCoy, George Isham Scott, Carlton Macy, Whitney Lyon.

Laws and Ordinances—George F. Chamberlin, Avery D. Andrews and Simon H. Stern.

House—Whitney Lyon, E. C. Chamberlin, Charles P. Doelger, Harrison K. Bird and Samuel H. Valentine.

Library—A. R. Shattuck and E. C. Schwarzkopf.

Membership—Gen. George Moore, George Isham Scott and J. Egmont Smith.

Auditing—George W. Young, Jesse W. Seligman.

On Foreign Relations—D. Wolfe Bishop, Jr., Clarence Gray Dinsmore and J. Dunbar Wright.

Good Roads Meeting of the A. C. of A.

The call of the Automobile Club of America for a meeting at the Waldorf-Astoria of the friends of good roads was responded to by nearly two hundred. The chairman of the committee on roads, Mr. A. R. Shattuck, was unavoidably absent and his address was read by Mr. Geo. F. Chamberlin, vice-president of the club. The paper was an exhaustive argument in favor of good roads not only for the automobilist, but also the bicyclist, the horseman, the farmer and everyone who uses the highway or is dependent upon it for pleasure or profit. It pointed out how the Empire State had expended miserly sums which were insignificant when compared with that of less wealthy neighboring States. For instance, Massachusetts had expended more than \$3,000,000 where New York State had expended less than \$100,000.

General Ray Stone, of Washington, D. C., formerly chief engineer of the Department of Agriculture, discussed the subject from a financial standpoint, and suggested plans for securing the funds for systematically carrying on road building.

Mr. E. G. Harrison, of the Road Inquiry Bureau of the Department of Agriculture, after giving an historical sketch of road building, pointed out the great advantages of good roads from a business, educational and social standpoint. Among the other speakers were Mr. Edward A. Baird, New York State engineer; Mr. Henry I. Budd,

Commissioner of Public Roads, State of New Jersey, and Mr. T. C. Mendenhall, of the Massachusetts Highway Commission.

Notes.

Belgium now has five automobile clubs, with a total of seven hundred and forty members. The Automobile Club of Belgium has four hundred, and the remainder is divided among the clubs of Antwerp, Liege, Charleroi and Flanders.

In connection with the thousand mile tour of the Automobile Club of Great Britain, there is to be held an automobile show at the Waverley Market, Edinburgh. Mr. Axel Wester, Gothenberg, Sweden, has undertaken the introduction of automobiles in Sweden.

The old cyclorama building in Fifteenth Street near Pennsylvania Avenue, Washington, D. C., is to become a storage and charging station for automobiles. The Washington Electric Vehicle Transportation Co. has secured the building and is making extensive repairs in order to fit it for its new occupants.

The Automobile Club of Belgium has decided to hold a contest, which will determine the members of the team that is to represent the club in the international race for the Gordon Bennett cup. Many members of the French club desired that its team be selected in a similar manner, and, if not in this way, to take those who could show the best record for the past year.

An ordinance has been presented to the city council of the city of Cleveland, O., which provides that all automobiles shall carry two lights at night, and a bell or gong at all times, which must be sounded one hundred feet from each crossing approached. The maximum speed limit is fixed at twelve miles per hour, and a penalty of not to exceed \$50 is to be imposed for noncompliance with the ordinance.

That eccentric genius, the late Frank Buckland, the naturalist, when he felt gaged took a railway journey, and, having armed his eyes with spectacles, hung his head out of the window, and averred that the perfect aeration of the lungs which he thus obtained was the finest stimulant he had ever discovered. Motorists experience the same invigorating effects of travelling at speed through the open air. One of the most enthusiastic "chauffeurs" in England was, and had been for some time, under the treatment of Sir William Broadbent for indigestion and nervous prostration at the time he invested in a motor car. From that day the doctor's occupation has ceased so far as this automobilist is concerned, as he now enjoys the most perfect health, and he puts this down entirely to motor driving.—London Daily Mail.

Charging Automobile Storage Batteries From Alternating Circuits.

By V. M. Weaver.

In nearly all of the larger cities at the present time are automobiles, and the number is increasing rapidly. Of the three methods of propelling them, the electric is reasonably sure of being found in all of these places. For charging the batteries

built by the Wagner Electric Mfg. Co., of St. Louis. On the right is shown the single phase self-starting induction motor, and to the left a shunt generator connected by a flexible coupling. It is very compact, and is easily set up and operated. The winding of the motor gives a loop terminal which is used only when the motor is being brought up to speed, or in case an overload is thrown on it. The

is impressed on the motor to start it, and when the switch is down a 220-volt current is thrown on. This brings the motor up to speed, and continues to run it. F is a rheostat in the field circuit so as to maintain a constant pressure of 125 volts.

Only two charging connections are shown, the others in the station being the same as these. At P P are the plug holes in which are inserted the terminals of the flexible cords with which connection is made to the batteries. In each circuit there is a regulating rheostat, R. A volt and ammeter switch, A, is so arranged that by a cross-arm the outer opposite clips may be short-circuited respectively to the inside and outside rings. This connection enables the attendant to read both the current and pressure in each circuit.

The battery is removed from the cab for charging, being drawn out on a truck. It consists of 48 cells with a normal discharge rate of 30 amperes. In charging it is the practice to commence with a 40 ampere current and continue until the battery takes 10 or 12 amperes at 125 volts, when it is ready to take the place of an exhausted predecessor. A truck carries it to the cab whose battery it is to replace. After every trip, whether the run is long or short, the battery is replaced by a newly charged one, and the driver, on leaving a station, always knows what he has to depend on. The company has a number of these charging stations distributed about the territory covered by its vehicles.

New Hydrocarbon Motor.

An automobile that promises very good results is being developed by Messrs. H. G. Catrow, of Miamisburg, and H. S. Lee, of Dayton, O. The motor is a single cylinder, four cycle, gasoline type, which

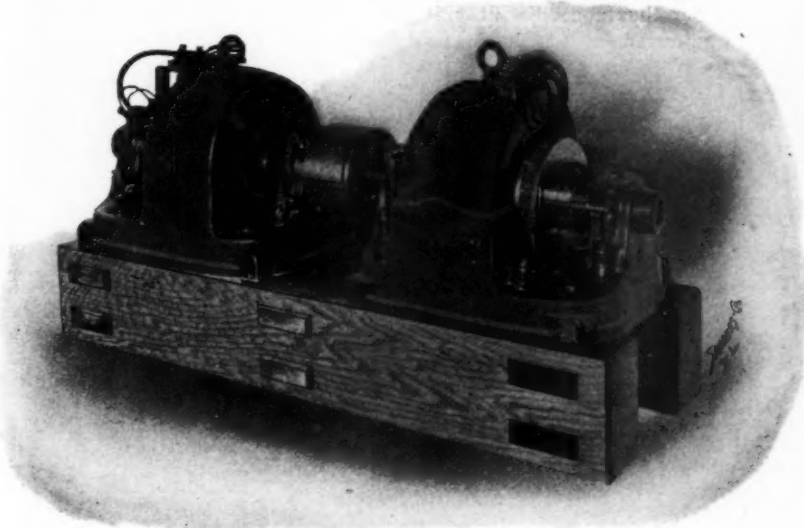


FIG. 1.—MOTOR GENERATOR.

of these carriages, direct electric current is necessary, but many of our cities have outgrown the earlier Edison direct-current systems, and the alternating current lines reach the outlying and newer parts of the cities. Charging stations established in such places for renewing the batteries of public and private automobiles must use some method of changing this alternating current to direct-current for such purposes.

To accomplish this a rotary converter, which is a dynamo electric machine having its armature wires connected both to

field coils are wound for either 100 or 200 volts.

The connection between motor and generator is by a friction clutch, the bearing surfaces being a set of solid rubber balls as shown in Fig. 2. In sizes above six kilowatts capacity more balls are used. Perfect insulation, noiseless separation and great flexibility are secured.

The charging outfit of the Illinois Electric Vehicle Transportation Co.'s sta-

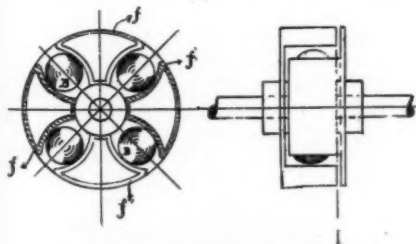


FIG. 2.—FRICTION CLUTCH.

a commutator and to rings, or a direct-current generator driven by an induction motor may be used. Of these two, the rotary converter is seldom used, since a synchronous motor is hard to start and trouble often occurs. The induction motor of the latter device is self-starting, and on this account is being adopted for this service. The demand for such outfits is sufficient for manufacturers of electrical machinery to build outfits especially intended for this purpose.

In Fig. 1 is shown an outfit of this kind

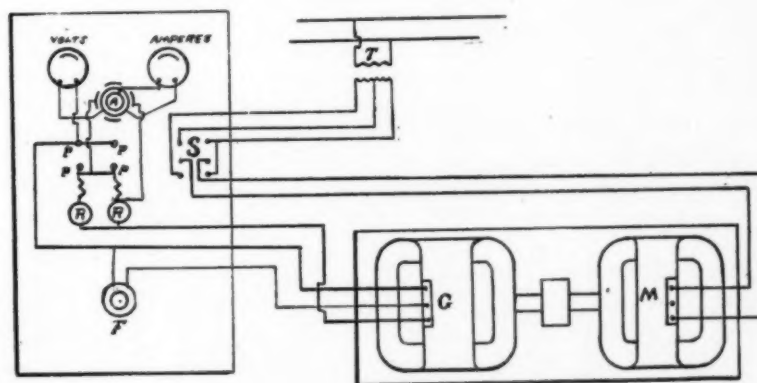


FIG. 3.—PLAN OF CHARGING PLANT.

tion at Forty-seventh Street and Cottage Grove Avenue, Chicago, is illustrated in the diagram Fig. 3. Two nine kilowatt outfits of the style shown are used. The generators give a direct current at 125 volts. In the diagram T is a reducing transformer, from 1,100 to 110 and 110 volts, so arranged that when the double-throw switch S is up a current of 110 volts

will develop about three-horse power. The special differential gear gives four speeds, as follows: Two, six, eight, and twelve miles per hour.

Two automobiles have been constructed for experimental work, and have been used in all kinds of weather and grades of different degree. Very satisfactory results are reported.

The Automobile

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CONTENTS:

The New York Show, Exhibits of Automobiles and Accessories.....	21, 22, 23
Club News and Views	24
Automobile Club of Baltimore.	
Club Lectures.	
Luncheon at the Club House.	
Standing Committees for 1900.	
Good Roads Meeting of the A. C. of A. Notes.	
Charging Automobile Storage Batteries from Alternating Circuits. By V. M. Weaver	25
New Hydrocarbon Motor	25
Editorial	26, 27
Meet in Buffalo in 1901.	
The Automobile and Good Roads.	
The Show vs. the Tour.	
The Automobile a Distinct Industry.	
On the Wrong Track.	
From Other Industries.	
The Automobile and the Drummer.	
The Invention of the Automobile.	
An Aid to Humanity.	
Cochet Motor Quadricycle.	
The International Race.	
The Automobile in 1950.....	27
The Automobile at Work. By O. P. Sook.....	28
What the People Say.	28
The Motor Tests	28
The Milwaukee Automobile	29
An Automobile Hospital Ambulance.....	29
The Steffey Motor Bicycle.....	29
A Thousand-Mile Tour.	29
The Automobile; Its Details, Management and Repairs. By Geo. T. Hanchett.....	30
The Gasoline Tricycle.	
A Suggestion for Gasoline Vehicles.	
Charging Batteries.	
Corroded Contacts.	
A Lesson from Spilled Electrolyte.	
How Much Power.	
Vehicle Weight and Battery Capacity.	
Some Considerations Concerning Light Automobiles.	31
New Storage Battery	31
New Offices and Salesrooms.....	31
The Loomis Automobile	32
The Quick Motor	32
The Locomobile Mail Carrying Tests.....	32
A Carbonic Acid Gas Automobile.....	32
Batteries for Igniters	33
To Invade America	33
Trade Notes	33
The Motor Car	33
Patents	33
Advertisements	33, 34, 35, 36

A person probably looking for notoriety more than to benefit his fellowmen, recently introduced an ordinance in the Chicago city council that was to compel all automobilists to equip their vehicles with fenders. The council have placed the matter on file, where it is quite apt to remain undisturbed.

Meet in Buffalo in 1901.

The events in connection with the Paris Exposition will be the greatest of the present year in the automobile world. The great event of next year should be in this country, and the Pan-American Exposition at Buffalo affords a grand opportunity. A meet of automobilists at that city would undoubtedly be favorably considered by the managers of the exposition. In the program it could be so arranged that automobilists from the more distant cities, following a prearranged schedule, could be joined at the various intermediate cities by delegates. In this way the occasion would be beneficial not only to those who were present in Buffalo, but to those throughout the sections traveled. The industry would be benefited by the greater numbers brought together and its magnitude more clearly demonstrated to the public. These tours from the cities of the east and west could be timed so as to bring all parties to the city on the lake at about the same time. The week following could be devoted to the automobile, day time to contests and out-door sports, and the evening to papers, discussions and the social features of the occasion. Representatives from foreign automobile clubs would undoubtedly attend, and make the meet of international importance.

The Automobile and Good Roads.

The automobilists of the east have taken a stand in favor of good roads, and will join hands with others seeking the same end. At a meeting of the Automobile Club of America, held recently, the club decided to cooperate in the plans of the friends of good roads for securing an improvement in the State of New York. The State legislature is to be urged to appropriate a sufficient amount to undertake this work in a substantial manner, and from year to year to supplement this appropriation with such amounts as will carry on the work. This matter has been brought to the attention of the State from time to time, but the appropriations have been insignificant, and the plans of the State engineer, which have been drawn to suit the amount to be expended, have been necessarily of a superficial character. The complaint has been made on both sides of the lack of appreciation, but the cause has not been far to seek. An appropriation adequate to undertake the work in accordance with modern methods of road building should be made. On this point the friends of good roads seem to be agreed.

The Show vs The Tour.

The fact has been previously mentioned in these columns, that a house show of automobiles does not satisfy the public. An automobile placed on a platform exhibits its outlines, its proportions, exterior finish, the beautifully varnished wood work and the nickled or Japanned metal work. It does not show a moving carriage, a vehicle

of motion which is the real automobile. Nor does it show the many variations of speed, its sensitiveness to its controlling devices, facilities for directing its course, ability to mount grades, durability and the many essential details of a satisfactory automobile. A canvas or photograph would show equally as well as the posed display. A horse in a glass case would be as effective as an automobile on a platform. The winter is the least desirable season of the year for a display of automobiles, since it does not permit of an out of door meet with comfort. Speed tests, hill climbing contests, exhibitions of skill in handling, etc., etc., would make an automobile show which would be worth seeing.

The Automobile a Distinct Industry

The automobile is an industry quite distinct from any other. It is neither a part of the carriage trade, nor is it a part of the street railway, bicycle or any other business. An automobile is not simply a carriage to which a motor is attached, not the substitution of a motor for a horse, but involves in its design new and special problems. The development of the motor is not the solution of the entire problem, but to this must be added the controlling devices, the transmission and application of the power to the driving wheels, proper braking facilities and the efficient mounting of this apparatus on a properly constructed carriage. This carriage is as distinct from the horse drawn vehicle as a locomotive is from a Pullman. It would have been as well for the builders of the stage coaches to have attempted to usurp the construction of railroad trains, as for any of the existing trades to have attempted to monopolize the automobile industry. This is an industry distinct and clearly differentiated from all previous industries, with new problems bringing forth new tests of mechanical skill and inventive genius.

On the Wrong Track.

By a misconception of the true conditions the publications of other trades have aroused unwarranted hopes and fears in their respective industries. The carriage trade has not gotten over the alarm occasioned by the appearance in active service of the automobile, and the bicycle dealers have greeted with enthusiasm the idea of bracing up their diminished profits by adding the automobile to their lists. It is still a question whether the fears or hopes of either will be realized. The bicycle repairer might study to advantage the construction of the automobile; the dealer, however, will find he has two distinct classes of customers, and the carriage builder will find he is dividing his energies. The builder of automobiles finds he has before him a sufficient field of work, and the dealer will find that there is a sufficient demand for automobiles to warrant his carrying exclusively a line which will show

to advantage the styles and kinds of automobiles which would be likely to suit his customers.

From Other Industries.

It is interesting to note in this connection the number of men the automobile industry has drawn from the ranks of the electrical industries and among this number are the well-known names of Corrigan, Riker, Sperry, Woods, etc. It is also worthy of note that but one builder of automobiles who exhibited at the recent show is also the builder of bicycles. One or two proprietors of bicycle factories have entered this new industry, but they have taken it up as a large coffee merchant took up sugar refining, not as a part of the coffee business, but as a new and distinct industry. The industry has drawn many recruits from other industries, but this does not detract from its individuality.

The Automobile and the Drummer.

Commercial travelers not in the cycle line visited the recent show at Madison Square Garden with a good deal of interest. The inspection of the automobiles usually called for information respecting their use on the road, matters of cost, speed, durability of machine, tires, etc. It was the general opinion that it would not be long before the "knight of the grip" would be traveling in his own car, making the trip, not by railroad schedule, but at his own convenience. Road maps, distances and conditions of roads will be studied in the place of the railroad time table. The subject of good roads will take the place of politics, and the weather for general conversation, and no more valuable ally is to be found of this cause than the commercial traveler. Automobiles will be built to fill the many requirements for the transportation of samples or small stocks of goods, for slow or fast traveling. In fact the salesman and his samples can draw up before the customer without the many inconveniences now experienced of unloading from train, the transfer to hotel or business house and the carriage from place to place. The expense will be reduced to the minimum, as there will be no excess baggage nor transfer charges.

The Invention of the Automobile.

The invention of the automobile is generally conceded to Cugnot, the Frenchman, who produced his steam carriage along in the eighteenth century. This curious vehicle is preserved in the Conservatoire des Arts et Metiers. Recently the Automobile Club of France appointed a committee to determine, if possible, the inventor of the gasoline automobile.

The work of this committee was not so difficult as might be expected, as it was found that M. Lenoir, to whom the first French patent for a gas engine was awarded, was still living in a little French village, and also some of his workmen.

Application for this patent was made in 1860, and specified, strange to say, electric ignition by the use of a Ruhmkorff coil. With amendments made later the specifications of the patent describe very fully the modern explosive motor. In 1862 he built a gasoline automobile, but later turned his attention to launch motors. His appliances seem to have been very complicated, and this is now given as the cause of their non success. The committee believes M. Lenoir the real inventor of this form of automobile, and recommends that the gold medal be presented to him. This veteran inventor is now seventy-eight years of age.

An Aid to Humanity.

The automobile that up to the present time has been considered chiefly as a pleasure vehicle or as a business wagon has now entered another field, where it will aid and help to alleviate the sufferings of mankind. The horse-drawn ambulance has reached the highest stage of perfection of vehicle it is capable. Rubber tires, efficient springs and interior furnishings have added to the comfort of the injured. To these, however, the automobile has added greater speed, electric lights and heat, as well as a more commodious interior. With the old system, in case of accident, the effort was made to bring the patient to the hospital as quickly as possible. With this new carriage more than temporary assistance can be given. A warm interior and electric lights will enable the physician to work with some advantage on the way to the hospital. It will permit patients to be transferred from place to place without danger even in severe weather.

Cochot Motor Quadricycle.

What seems a great improvement on the style of quadricycles now in use has recently been introduced in France by M. G. Cochot, 45 Rue Tangee, Paris. In place of the rear saddle seat is mounted an upholstered seat similar to the forward seat now in common use. This arrangement gives two comfortable seats.

The pedals are abolished and a tight floor placed in front of rear seat. It seems as if a vehicle half-way between these might be devised. A drop-frame in place of the diamond and a seat which would be more comfortable than the saddle could be devised that, if occasion required, would permit the use of the pedals.

The International Race.

Several of our automobilists are busy perfecting their racing automobiles preparatory to the international race. The time till June 14 is very short to allow thorough tests being made beforehand. The route of this race chosen is from Paris to Lyons, by way of Etampes, Pithiviers, Montargis, Nevers, Moulins, La Palisse,

Roanne, Villefranche and Lyons. The road as far as La Palisse is flat and excellent going, but beyond that point becomes hilly and slightly mountainous after Roanne, when the Beaujolais and Lyons heights have to be crossed. The distance fixed is about 560 kilometres (350 miles). The start will probably take place at Versailles very early in the morning. This will probably be the greatest automobile event of the year, and the regret is that more of the clubs have not posted the forfeit. The reputation of the French chauffeurs was probably too well founded for the automobilists of some of the neighboring countries to enter with any hope of success.

The Automobile in 1950.

A very interesting little fiction regarding a trip around the world in the middle of the coming century appears in a recent number of the Saturday Evening Post. On this trip the traveler unfortunately or fortunately misses his train at Chicago, and the pursuit of the limited is thus described:

The twentieth century, luckily for us, is the age of good roads. As well as I can make out, the invention of the bicycle first suggested to Americans the idea that it was worth while to make smooth and durable the paths of travel. Then came the automobiles—now differentiated and specialized to so extraordinary an extent for every imaginable vehicular purpose—and they demand satisfactory roads. The United States—infinity surpassed by Europe in this respect fifty years ago—has to-day the finest system of roads in the world, city being connected with city by magnificent boulevards. My impression is that none of these boulevards is more majestic than that which, originally a Chicago street extended, now stretches from the metropolis by the lake to the flourishing city of Davenport.

Within fifteen minutes after missing our train we are relieved from anxiety by securing a liquid air automobile, in which we embark for Davenport. The man in charge of the vehicle demands an extortionate price for his services, but we are not in a position to haggle, and so agree to pay him what he asks. It is the first long distance trip that either of us has ever made in a conveyance of this kind, and we enjoy it hugely from beginning to end. The boulevard, one hundred feet in width, and lined on both sides with tall poplar trees that cast immense black shadows, is brightly illuminated with electric lights. So smoothly does the carriage glide over it on rubber-tired wheels that we seem almost to be flying, and the pace being steadily accelerated, we soon begin to realize that we are actually traveling at a rate exceeding one hundred miles an hour. It is exhilarating to the highest degree, though the air pressure is something tremendous, and were it not for the wind shield protecting the driver and ourselves we should be blown out of the vehicle.

The Automobile at Work.

BY O. P. SOOK, M.D.

May 18th, 1899, I placed an order for a new model Crouch steam carriage, having, after much investigation, decided that steam was reliable, and the mechanism through which it acted generally better understood. Repairs are as sure to be needed, as that the horse will need shoes, and probably physic, and the harness stitched up, etc. Most all towns, however small, have a machine or blacksmith shop where ordinary repairs can be made, without having to send machine back to the factory, a very costly proceeding.

The automobile with coil water-tube boilers is as safe, as far as explosions are concerned, as a horse-drawn vehicle. They may be burned out, tubes cracked, and become lined from using hard water, and neglect in keeping clean by blowing off, but like everything else, in the hands of careful people, will last longer and give better satisfaction than in the hands of those who think, because it is a machine, it needs to be kept on the utmost strain, as a test of its merit.

The automobile requires but little room to house, which to some is quite a feature, is comparatively cleanly in its habits, and by giving attention to tanks and batteries when not in use, will be ready for service in a very few minutes, even with steam from cold water. By having a small gas jet under the generator to keep it hot two or three minutes is all the time required to get away. The automobile is very easy to learn to control, but needs a level head, not to be recommended for those going out for a "time." It is consequently a practical temperance advocate. After the first cost, which at present is tolerably high, the cost to operate is nominal. When not in use absolutely, it does not consume anything. The horse eats just the same, and requires the same attention, when idle as when at work. The repairs on an automobile are mechanical, within the range of man's ability, and differ from the anatomical and physiological impairment and consequent complication and delightful uncertainty in regard to time and cost in repairing ailments of our much loved and much abused time honored friend, the horse.

The automobile not only requires less room to house, but requires only half the room on the streets to do business; does not shy, which also means less room; is more under control, which means much; is more speedy than the horse, which is the telling feature in this advanced stage of civilization. Not least among its many good features are the delightful sensations in being transported around in an automobile, which have been aptly described as being like the feelings in coasting in childhood's happy days, with this difference, you don't have to walk all the way up all the hills. The roads and streets over the country generally are a disgrace, being

the arteries of business and the foundation of the life of the business interests. I would favor putting less money in public buildings, such as court houses, churches, parks, senseless monuments, and build good roads. After that other things might follow, but good roads first, and good roads all the time.

What the People Say.

We rode around town in this wondrous machine,
The people all stared, 'twas the first they had
seen;
Complete in itself, and a beauty all over,
And on it a name, oh so sweet, "Kitty Clover."

You could scarcely believe that it was a machine,
It glided so swiftly, so noiseless and clean;
We must praise the inventor, who surely is no
slouch.
He stands well in the front, Mr. Lee W. Crouch.

This product of his is the outgrowth of years,
Of toil and experiment moistened with tears,
Of nights spent in wakefulness, days full of grief,
But he battled on manfully, so strong in his belief,

That in Nature were forces, which if aptly
subdued,
Could be made to serve man, and result in great
good.
Not alone in old channels, where they are al-
ready chained,
But in some rather new ones, as before was
explained.

Now, in using these wagons, not a pang of re-
morse,
Will be kindled within, for discarding the horse.
The horse, though not human, he is subject to
pain.
Oh, so harshly inflicted, through lash and through
rein!

And could we his feelings, here fully present,
He would hail with great pleasure the ransom
thus sept.
On the machine's first appearance, some frights
may attend,
Yet their presence but marks the beginning of his
end.
—O. P. Sook, Newark, O.

The Motor Tests.

The series of motor tests organized by La Locomotion Automobile, and to which I have made reference from time to time in these columns, continues the even tenor of its way at the works of Messrs. Malicet and Blin. Those details of the tests which have been issued, meagre though they are, give promise of numerous important revelations to come, and the organizers can already be congratulated on having instituted a concours which will throw considerable light on many of the problems at present perplexing constructors of automobiles. It is too much to expect that all the difficulties of this great industry will be explained, and that in the near future manufacturers will be able to build motors and automobiles with the same perfection of design and execution which to-day characterises the construction of cycles. No, that can hardly be hoped for, but undoubtedly these tests will bring sufficient to light to materially advance the engineer's task of arriving at the perfect car. One of the points noted during the trials made up to date is that the generality of motors attached to cycles and voiturettes have only developed the power for which they were sold by the constructors on an average of once in every ten tests made on the brake. And this has only been obtained by the removal of the 'silencer,' the power in-

stantly diminishing upon the re-attachment of this very necessary part of the automobile. Of course, it is hardly fair to criticise until all the tests have been completed, but as the record now stands it reflects no credit on the manufacturer. The purchaser of an automobile of specified horsepower justly expects that he will have this horsepower at his command under normal conditions, and not that it will only be forthcoming by adopting such means as the removal of the exhaust box. And here be it noted that presumably the silencer of each engine under test is clean and not clogged up as it so often becomes after a few months' continuous use. I remember that in England certain purchasers of the earlier productions of the Daimler Company found the power of the motor diminishing after some little time, and ascertained that this was entirely due to the fouling of the holes in the "silencer." This, however, was but a natural consequence of the employment of the silencer as then made, but in the trials under notice it would appear that even with fresh and clean exhaust boxes many engines do not give off the "advertised" power. On certain of the larger types of motors for attachment to vehicles it is said that the loss of force in this direction amounts to no less than one horsepower. Another point that is likely to be made clear is the exact difference between the power of the motor itself and the power exerted by the driving wheels. Every automobilist is well aware that much of the engine's force is lost in that chaos of chains, belts, and cogwheels which make up the transmission gear, but few, I venture to think, entirely realize what this loss amounts to. In the tests so far made it has been ascertained that the force exerted by the driving wheels of a car fitted with a motor actually developing on the vehicle eight HP., does not exceed five HP., a conclusive proof that there exists plenty of room for improvement in the matter of driving gears. Then, too, numerous experiments are being made with varieties of carburettors on different types of motors; indeed, the entire work is being carried out in a wonderfully complete manner. It is to be hoped that a minute record of the proceedings and the theories deduced from the experiences will be published in due course, for these details will prove of the greatest value to all persons connected with the automobile industry.—Motor Car Journal.

Mr. Thos. L. Proctor has resigned his position with the Riker Electric Vehicle Co., of Elizabethport, N. J., formerly the Riker Electric Motor Co., of Brooklyn, N. Y. For twelve years Mr. Proctor has been connected with the Riker interests, and in that time has been made many friends in the automobile industry who will wish him success wherever he may choose to continue his work.

The Milwaukee Automobile.

Steam automobiles are being built by the Milwaukee Automobile Co., of Milwaukee, Wis. The style now being constructed is a complete carriage of the run-about type. A complete steam plant, with fuel and water, automatic in action, is carried within the carriage body.

The wheels are 28-inch wheels, forward and back being the same size. Metal spokes and two and a half inch pneumatic tires are used. The tread is four feet two inches, and axles are four feet ten inches apart. The total weight with tanks and boiler full is 700 pounds. Forty miles of supplies are carried.

The operator sits on the right hand side of vehicle, steering the vehicle with his left foot, and controlling the steam valve and brake with his right hand and foot respectively. The water glass and steam gauge are located convenient for inspection. The entire carriage and its driving mechanism are carefully tested before leaving the factory, and are fully guaranteed by the company.

An Automobile Hospital Ambulance.

St. Vincent Hospital, New York city, is the first to have an automobile, the most up-to-date conveyance, in its regular ser-

vice. This ambulance, which will be used in carrying patients to and from the hospital, has room for two patients at the same time. It can be entirely enclosed, and is lighted and heated by electricity.

It is ten feet eight inches long by fifty inches wide. The windows are bevel-plate glass. The interior is finished in the

most approved style. The drivers seat will accommodate two persons, and the hood reaches over it.

The motive power is electricity, supplied by the chloride battery of 44 cells, con-

cealed beneath the body of the vehicle. The motors, one geared to each of the two rear wheels, are two-horse power. The controller is placed beneath the seat, and gives a speed that can be varied up to fifteen miles an hour. The battery is good for twenty-five miles from one charge.

The running gear is another of the novel features. A pedestal form of gear

are Frederick R. Wood & Son, of New York.

The Steffey Motor Bicycle.

Photograph and description of a light motor bicycle recently received from the Steffey Mfg. Co., of San Diego, Cal., are given herewith. The whole apparatus is very compact, as will be seen by an inspection of Fig. 2. It will go between the cranks of a narrow tread wheel, thereby enabling the rider to use the pedals, should gasoline run out or anything happen to the motor.

The motor is four cycle, using gasoline, and weighs about twenty pounds. It has electric ignition, is built with radial ribs for air cooling, or with a water jacket, to suit the purchaser. The motor and attachments are so designed that they can be attached to any diamond frame, or be detached therefrom, in a very few minutes.

Any speed, six to twenty-three miles an hour, may be obtained, and a ten per cent. grade is mounted with ease. The speed is controlled by a small lever near the handle bar, or by an electric button close to the end of the handle bar. It is perfectly safe, runs quietly, the exhaust being inaudible. The muffler, which has been designed by the company, occupies but a few inches of space and weighs but a few ounces.

The company also builds tricycles and a light-weight motor, specially designed for carriages.

A Thousand-Mile Tour.

In order to show what the automobile is capable of doing, as well as to increase the interest in this new industry in Great Britain, the Automobile Club of Great Britain is preparing for a thousand mile tour. The automobiles competing will be divided into classes, and prizes will be offered in each class. Mr. Johnson, secretary of the club, recently covered by automobile most of the proposed route.



FIGS. 1 AND 2.—THE STEFFEY MOTOR BICYCLE.



AN AUTOMOBILE HOSPITAL AMBULANCE.

is used, which the builders adopted for the neater appearance and greater flexibility. Wood wheels, with three-inch solid rubber tires, are used. The front wheels are the steering wheels, and are of a less diameter than the rear wheels.

At the preliminary test of this ambulance, which was a run from the works of

The Automobile—Its Details, Management and Repair.

CONDUCTED BY GEORGE T. HANCHETT.

THE GASOLINE TRICYCLE.

For all vehicles which are propelled partly by the feet or are started by pedals gasoline is undoubtedly the best at the present stage of the art. Stripped of its box of gears and friction clutches the gasoline engine becomes simpler and lighter than any equivalent motive device which has yet been produced. It can be very simply applied to any pedal propelled vehicle by belt or chain. There is certainly a market for a complete gasoline equipment which can be fastened to any bicycle, and it has already been in part invaded by small engines which have been offered for sale for that purpose. What the public wants, however, is a complete equipment. Engine, tanks, pulleys, belt, batteries, piping, etc., all of which they can attach themselves to the wheel and ride machine propelled. The limiting weight for such an equipment is about seventy-five pounds.

A SUGGESTION FOR GASOLINE VEHICLES.

Self-starting gasoline vehicles, if constructed with a view to reasonable economy in first cost and subsequent operation and with moderate simplicity, will certainly control the gasoline automobile situation. It would seem that this vehicle is not so far away as many inventors and builders imagine. Most gasoline engines of this type depend upon compressed air for starting purposes. While running the engines the air is compressed in a suitable receptacle, and when starting this stored energy is used to make the piston perform its initial strokes. A suitable tank for compressed air will certainly rival a box of gears in lightness and it may not only replace the gears, but also the tank containing the cooling water, which is now a very heavy portion of the gasoline equipment. Let there be attached to a gasoline engine a pump which compresses air in a suitable cylindrical receptacle more air than is needed for starting purposes. Let this surplus air be expanded into the chamber surrounding the cylinder and let it also be mixed with gasoline for the purpose of forming an explosive mixture. The refrigerative effect of the expanded air around the cylinders will keep them cool. The mixture of gasoline and air introduced into the cylinder under pressure can be arranged in a suitably designed engine to sweep the old charge before it, thereby enabling the engine to get an impulse every revolution instead of making an extra revolution to exhaust the spent gases. A two-cycle engine is very much lighter per indicated horse-power than a four-cycle engine.

If these devices are cleverly incorporated into the design of the engine we shall succeed in effecting the following reductions of weight:

1. The gears and clutches.
2. The water tank and circulating water.
3. The weight of the engine, gained by increasing the output per pound an indicated.

This will much more than counterbalance the weight of the compressed air tank and will probably make the vehicle enough lighter so that the power expended in compressing the air will not take one ounce of gasoline per ton mile from the efficiency of the vehicle. Moreover, and most important, the vehicle will be self-starting. The proposition is attractive and worth some study.

CHARGING BATTERIES.

"This business of sending out batteries to be charged is tiresome. What do I need to do my own charging, and how shall I do it?" You need a voltmeter, an ampere meter, a rheostat and a source of direct current electricity at suitable pressure. If you have forty to fifty cells the electricity should be at a pressure of 110 volt, the rheostat should be able to carry the rated charging amperes at 30 volts pressure, the voltmeter should be able to read to 150 volts, and the ammeter to 50 per cent. more than the rated charging current. These figures represent the most frequent conditions. You don't need expensive instruments. Cheap ones will answer and you can do without the voltmeter, though it is better to have it. If you have instruments on the vehicle they will do. Now as to connections: Select the positive supply wire. If you don't know which is positive connect the voltmeter across. If it deflects the right way the positive wire is in the positive binding post. Positive is marked +. Now connect the + wire to the + binding post of the ammeter. Run a wire from the other ammeter binding post to the rheostat. There is no need to pick binding posts on the rheostat. Either will do. From the free terminal of the rheostat run a wire to the + terminal of the battery, and from the negative terminal of the battery run a wire to the other supply wire. Be sure all the rheostat resistance is in before the last connection is made. In making the last connection make a flying touch of the wires first. See if the ammeter indicates less than the rated charging current. If so, complete the contact and turn the rheostat till the ammeter indicates charging current. In half an hour or so you will find the indication lower. Adjust the rheostat till charging current is indicated once more. Continue this process of adjusting at intervals of half an hour or so till the batteries are fully charged. They boil when they are fully charged. The whole solution will look milky. If the batteries are to be charged in the vehicle, the connections are the same. The instrument

connections are usually already made. It is only necessary to insert the rheostat and be sure that the positive supply wire after passing through the various connections ends at the positive terminal of the batteries.

CORRODED CONTACTS.

This is a frequent storage battery trouble and there is a remedy. The contacts should be thoroughly cleaned and painted with vaselene. The fumes due to charging should be avoided as much as possible by making sure that they have a chance to escape. Particularly is this true if the vehicle is charged with the batteries in place. All covers should be removed and everything done to facilitate the escape of fumes. Those contacts between the cells that never require to be broken should be burned together by a continuous band of metal. Contacts made of different metal, e. g., lead and brass, are certain to corrode if not frequently cleaned and greased.

A LESSON FROM SPILLED ELECTROLYTE.

In removing a crate of batteries from a vehicle one day the user may be somewhat annoyed to find the bottom of the crate drop out and spill the cells on the floor. This is precisely what will happen if care is not taken to keep spilled electrolyte from the woodwork of the crates. Electrolyte is sulphuric acid, diluted it is true, but amply able to rot out a heavy oak crate soaked in asphaltic paint, or even P. & B. This accident has happened so often to the batteries of those who ought to know better, that it seems well to warn those who don't know.

HOW MUCH POWER DO THE ELECTRIC LIGHTS TAKE.

Only a very small part of the available power. Consider the case of a light two-passenger vehicle weighing 1,500 pounds. The battery will weigh roughly about 500 pounds, and will have a watt hour capacity of about 3,000 for a thirty-mile radius. Suppose the lamps of eight candle power and that there are two of them. If the run is made in three hours, the lamps will consume 180 watt hours, or six per cent. of the total battery capacity. Yes, we can afford electric light.

VEHICLE WEIGHT AND BATTERY CAPACITY.

Automobile users sometimes want to get an idea of the necessary capacity of a battery to propel a vehicle a given distance. The calculations may be based on 120 watt hours per ton mile. For instance, a vehicle weighs complete 2,500 pounds. We wish to propel it thirty miles at a single charge. What is the capacity of the necessary battery and ampere hour capacity of each

cell? There are $2,500 \times 30 = 75,000$ pound miles, or 37.5 ton miles. The watt hour capacity of the battery, therefore, is $37.5 \times 120 = 4,500$ watt hours. If the battery operates at 80 volts, as is usually the case, each cell must have a capacity of $4,500 \div 80 = 56.25$ ampere hours. It is also convenient to remember that there are about 6 watt hours per pound of battery. This makes the battery weigh $4,500 \div 6$, or 750 pounds. This 750 pounds is part of the 2,500 pounds the vehicle was to weigh.

Some Considerations Concerning Light Autocars.

In a paper read before the engineering society of Coventry by Mr. Henry Sturme, the light automobile was discussed and illustrated by lantern slides. The situation was thus described:

Doubtless everyone would like a vehicle with forty horse-power, which will romp up hills at as many miles an hour, but where the purse is limited we must cut our coat according to our cloth, and the same way as a man who invests in a pony and trap does not expect to get the same results as he would obtain with a high stepper and a dogcart, or with a carriage and pair—for the simple reason that he knows that he cannot get them—so the person for whom the builder of the autocar has to cater will be satisfied if he can get reliability with fair speed at a price within his reach. Mr. Sturme referred to the great development of this class of trade on the Continent, and by means of illustrations of one of the best types of Continental voitures pointed to the extreme crudeness of many of its constructional features, particularly referring to the penchant which French makers appear to have for the introduction of numerous, and in many cases wholly unnecessary, bevel gears into their transmission arrangements, and pointing out also the barbarity of such contrivances in the way of speed-changing mechanism as required face to face engagements of gear wheels running at very high speeds. He then proceeded to show by means of illustrations his own design for a car upon somewhat novel lines, pointing out that the vehicle, although crude in some particulars of detail, was designed primarily with a view to simplicity of parts and cheapness of production. He uses a double frame, attaching the main frame rigidly without the interposition of springs to a live axle, and carrying it forward over the front wheels, upon which it is supported by springs in the usual way. Carrying a De Dion motor here, and fitting the coil and batteries in boxes on each side of it, and using a Parson's carburetter, the motion is carried by a four to one gearing through a chain to a second motionshaft just behind it, the gear wheel transmitting power to this shaft being connected with it by a clutch. This shaft carries a three-speed gear upon novel lines, from which, with a single

chain, the power is carried back to the driving wheels. This was virtually all there was in the way of machinery in the car, and a foot lever first threw the ignition back, then put the clutch out of gear, and then applied a band brake on the balance gear, whilst a secondary tyre brake was applied by a hand level fitted at the front; indeed, the whole of the machinery was carried forward of the footboard, and the seat, which would be made of basketwork, supported upon a simple loop frame, hinged at the back of the dashboard, and supported rearwards by straps depending from C springs, this secondary seat frame having the one function only of carrying the seats, and being entirely independent of any of the connections or gearing of the lower framework. Mr. Sturme hoped that the new vehicle, when complete, would weigh about 450 lbs. with cycle wheels and solid tyres; that with a De Dion two and a quarter horse-power motor it would run (at 1,600 revolutions of the motor) at four, eight, and twelve miles road speeds, whilst the steering by bicycle handles, with carburetter and ignition levers on the steering post, would, with the foot lever before mentioned, render the management particularly easy, and he thought that the vehicle complete could be retailed with a fair profit to all concerned at about £125, but he pointed out that automobile builders were not confined to the petroleum engine for the production of cheap cars, and referred to the development of this branch of the industry in the States. He stated that in the light steam carriage the furnace and boiler presented the main difficulties to be overcome, and commencing with the experiments of Cugnot and Gurney he dwelt on the first principles involved in designing steam boilers, proceeding then by means of illustrations to describe the Serpollet system as used in France, but which he pointed out could not be used in the production of a light vehicle, and, dealing especially with the American carriages, he illustrated and described the water tube boiler system of Crouch, of Baltimore, in which one set of helical coils were used to produce the steam which was taken down through another set, and superheated before being passed to the engine. The carriage and boiler of Whitney were described and dealt with, as well as those of the Stanley car, whilst the leading features of the new Overman vehicle were likewise pointed out, and, concluding his remarks upon the American carriages, he said, "Undoubtedly there is large room for experiment and investigation in the construction of light steam carriages, and the American makers above referred to have shown us what can be done, but they have not by any means done everything. We have to remember that in such small boilers as are necessitated by this construction, the furring up, or mineral deposit from the water used, may very quickly become serious, and where no automatic supply is used with

boilers of such small capacity, the driver's attention has to be constantly centred upon this point, the slightest inattention to which will result in a burnt-out boiler tube." He also referred to the drawbacks, as well as the advantages, of automatic firing, and to the entire absence of any attempt in the American cars at steam condensation, and concluded with a reference to a new car which is being constructed in Manchester, in which a novel system, both in boiler and condenser, is used, the tubes, instead of being parallel sided, being made up of a series of truncated cones.

New Storage Battery.

In the construction of the storage battery nearly all inventors have taken the lead plate as the foundation. This sheet of lead has been pressed or worked by specially contrived machinery into a form according to the ideas of the builder to hold the spongy lead in place and give strength to the plate. Quite different from this corrugated, stamped or grooved plate is the battery recently devised by an English house with special reference to the requirements of the electric automobile. The rectangular frame which usually holds the plate is retained with lead wires running vertically across the frame at regular intervals. In and out between these wires is woven a thread of spun glass until the frame is filled. Upon and in this fabric of spun glass is placed the lead oxide, and the lead cross wires afford ready conductors to the frame. This arrangement is said to hold the lead oxide securely, and the spun glass being loosely woven, the acid circulates freely. Between the two plates of a cell is placed a sheet of spun glass. The perfect insulation between the two plates is thus obtained. A battery of this kind is shortly to be placed in an automobile and thorough tests are to be made. Lightness is the chief claim made for these cells. The ampere hour capacity per pound of battery is said to be far above the ordinary battery. The battery is also adapted for electric ignition of gas engines on motor cycles and gasoline automobiles.

New Offices and Salesroom.

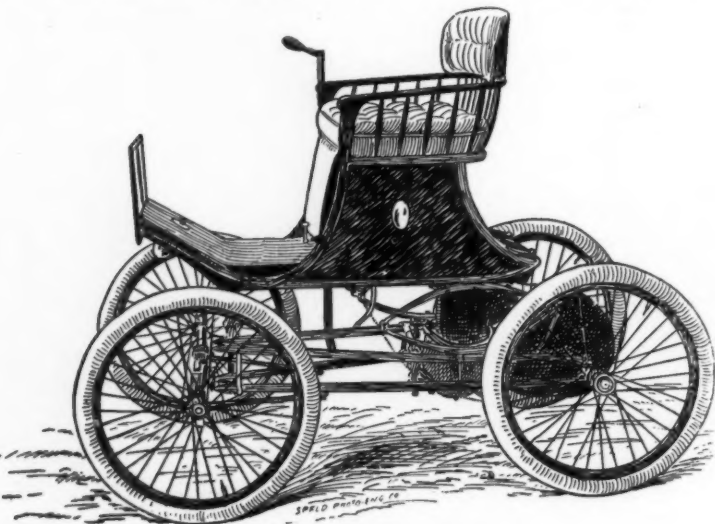
The New York Electric Vehicle Transportation Co. is just opening up a show and sales room for the display and sale of all the various types and styles of automobiles manufactured by the Electric Vehicle Co. The new store is located in the Loraine Bldg., 541 Fifth Avenue, corner of 45th Street. The present offices of the company, now located at 100 Broadway, will be removed to the new store. The company has just opened up a new operating and repair station corner of 50th Street and Eighth Avenue. A number of new cabs will be put in operation by March 1st, and within the next two months the company states that the number of vehicles in service will be fully double those in present use.

The Loomis Automobile.

The light automobile runabout illustrated herewith is built by the Loomis Automobile Co., of Westfield, Mass. Its chief claim, aside from its extreme lightness, is that the entire driving mechanism is mounted on the running gear leaving the body free on the springs.

The motor is a $2\frac{1}{2}$ horse power gasoline, used without a carbureter. It is geared to rear axle, and speed is regulated by varying the time of ignition. A speed from one to fifteen miles an hour is thus obtained. Motor is air cooled. Ball bearings are used throughout.

The frame is steel tubing, the front axle has a special equalizing joint at center, so that obstructions do not interfere with the driving wheels. Steering is by the front wheels, the lever arm being placed at side of carriage instead of center as ordinarily. The wheels are wire, with pneumatic tires. All bearings are self-oiling, the ball bear-



THE LOOMIS AUTOMOBILE.

ings being packed in heavy lubricant and are dust proof.

The weight is but 315 pounds, a heavier road wagon is under construction, and also a delivery wagon.

The Quick Motor.

The gasoline automobile motor used by the Quick Mfg. Co., of Paterson, N. J., on the automobiles built by them, and also supplied separately to customers, has a number of important features in its construction. It is a four-cycle motor, with two cylinders. The crank shaft is in one piece of open hearth, forged steel. The connecting rods are malleable iron, with bronze bushings. The pistons are cast-iron, with packing rings and wrist pin of hardened steel.

Electric ignition is used. The valves are operated from shaft across cylinder cover, driven by chain from sprocket wheel on crank shaft, and miter gears on the valve shaft drives igniter. All bearings are fitted with bronze bushings. For use in this motor 74 degree gasoline is recommended.

The Locomobile Mail Collecting Tests.

The specially designed locomobile shown in the accompanying illustration has recently been tested at Washington, D. C., by the post office authorities. This new style of steam wagon has been called the "locomobile." It is of the light delivery type and intended for loads of from 500 to 1,000 pounds.

The trips began at Pennsylvania Avenue and Twenty-first Street and extended westward to Rock Creek, on both sides of the avenue. The start was made from the post office for the first trip at 10 and before 11 o'clock the wagonette, and the buggy which accompanied it, were back at the office, having gone to the route, made the collections from twenty-three boxes, and returned. In the afternoon the same ground was covered in about the same time. The actual time covered by collections was thirty-two minutes.

The locomobile is a steam power machine, in which the steam is generated by a gasoline fire. The steam exhaust makes almost no noise, and the machine speeds over the asphalt pavements almost as silently as a bicycle. The mechanism is simple and compact, and is operated with little difficulty apparently. A small hand lever controls the power, a rod in front is the steering apparatus, and a foot brake stops the wheels. The machine is capable of making forty-two miles when the way is clear, but on these trips the time between the boxes was between fifteen and twenty miles.

Mr. Merritt said of these trips and of a delivery trip made on Tuesday: "The tests demonstrate beyond question that the locomobile is speedy, and that the time on trips may be cut down from a half to two thirds. I went over the entire route in a buggy and watched the collection. Everything ran smoothly and no difficulty was encountered anywhere.

"A delivery trip to the uptown hotels was made on Tuesday, and this was even more successful than the collection trips. We went to all the uptown hotels, includ-

ing the Cairo, in thirty-eight minutes. The schedule time is an hour and a half."

Superintendent of Delivery Bell is particularly interested in the tests. He said: "The question of time-saving seems to be demonstrated beyond doubt. As to the availability of the locomobile pattern of machine it seems to me well suited to our needs. The present vehicle requires a driver in addition to the carrier, in order to save time, but it would be perfectly feasible to construct one with an opening in the rear similar to the present collection wagons, which could be operated by the carrier."

Mr. F. E. Foster, of the Washington office of the Locomobile Company, 1026 Connecticut Avenue, is superintending the tests for the company.

A Carbonic Acid Gas Automobile.

An automobile to be propelled by carbonic acid gas is being perfected by the American Automobile, Motor & Power Co., of Brooklyn, N. Y., using patents



THE "LOCOMOBILE."

and devices of Geo. Rothenbucher. The motor is a two-cylinder double-acting engine, with a central valve operated by eccentrics on the crank shaft. Sprockets are fastened to rear wheel hubs, and are driven by chains passing over the small sprocket wheels on the ends of crank shaft.

In steering the vehicle, which is done by a hand-wheel, the wheel on which the wagon is turning is automatically thrown out of gear by means of a clutch, and the outer wheel alone is driven. This is very ingeniously accomplished without either a differential gear or driving the wheels from separate motors. The idea of this driving mechanism is to attach it to any wagon or carriage; to utilize the present styles of vehicles by the application of this motor.

Two carbonic acid gas cylinders, such as are to be found at soda water fountains, are used. These are placed in the wagon box lying at the outer side. The pressure of this gas is lowered by a reducing valve and passes through a coil over a gasoline flame before going to the engine cylinders. Compressed air can also be used in the same way in this motor.

Batteries for Igniters.

A very compact battery outfit for hydrocarbon engines is illustrated in the cut shown herewith. It is $8\frac{1}{2}$ by $8\frac{1}{2}$ by 5 9-16 inches, and is intended for motor carriage use. Another form is designed for automobile tricycles, quadricycles, etc. On the top of the battery will be noticed the resistance switch, which is one of the important features of this outfit.

It has been the aim of the makers, the Dow Portable Electric Assistant Co., of Boston and New York, to produce an outfit that will be serviceable and reliable throughout its life. Many batteries that have only the item of cheapness to commend them are on the market. Their force, while ample at first, soon dies out, and becomes too weak to produce a spark. This company, with a full knowledge of these defects, have, after an experience of eight or ten years, produced the outfit



BATTERIES FOR IGNITION.

shown herewith. This will register 8 or 9 volts and 8 to 10 amperes. By means of the resistance attachment this output can be regulated to the desired amount and the energy of the batteries at the same time will be saved.

To Invade America.

The recent visit of Mr. H. J. Lawson and Mr. E. J. Pennington to America is already bringing about some important movements on this side of the Atlantic. Arrangements have, we learn, just been completed for the shipment to America of the whole of the stock of Daimler cars of Stirling's Motor Carriages, Limited, as also a number of bodies for Pennington cars. In addition, we understand that several of the Napier racing cars and several motor-tricycles are to be despatched to America within a few days. Mr. C. J. Wridgway has already sailed for the United States in connection with the matter, and Mr. C. Jarrott, the Secretary of the British Motor Company, Limited, Mr. Letts, of the British Motor Coupe Company, and others will leave for the same destination on Wednesday next. The news of the invasion of America by motor-vehicles from England has created considerable interest in automobile circles here, and no doubt the arrival of the cars in New York will be the means of giving the

movement a further impetus in that great country.—Motor Car Journal.

Trade Notes.

The Steffey Mfg. Co., San Diego, Cal., contemplates starting a factory in the East for the construction of their gasoline motor for bicycles and automobiles.

The Ohio Electric Works, Cleveland, O., recently received an order for 1,000 spark coils to be used on automobiles in connection with small dry batteries in sparking outfits.

The United States Automobile Co., of Pawtucket, R. I., expects shortly to organize an automobile cab and omnibus service in the cities of Rhode Island. The special motor used by this company is said to possess several very desirable features.

The Bridgeport Brass Co., 19 Murray St., New York, are makers of air pumps for automobiles, oilers, tire repairing outfits, torches, lamps, etc.

The Judd & Leland Mfg. Co., of Clifton Springs, N. Y., has a fine line of air pumps out this season. Their cyclone floor pump is intended for heavy service. The cyclone power pump is adapted to large users of air. The New York office is at 107 Chambers St.

The Buffalo Specialty Co., of Buffalo, N. Y., has placed on the market a never-leak tire fluid, which, when injected into the tire, will not evaporate and is always there to close a puncture. Fred. H. Wood is manager of the New York office at 273 Church St.

Frederick R. Wood & Son, 219 W. 19th St., New York, will undertake the construction of automobiles. The ambulance recently completed for the St. Vincent's Hospital is but the forerunner of others of this class. A specialty will also be made of delivery wagons.

The Plume & Atwood Co., 29 Murray St., New York, is getting out a new lamp for automobiles, which will be one of the most up to date on the market.

The Boston Artificial Leather Co., 12 East 18th St., New York, is going to give special attention to supplying Moroccoline to the automobile trade. This substitute for leather has been indorsed by a number of builders, who have found it meeting in every way their requirements.

William Roche, 42 Vesey street, New York, reports that the demand for dry batteries for gas-engine use is increasing and that the "new standard" is much in favor.

The Motor Car.

The coaching days are all gone by,
The railway supersedes,
The motor fly we'll have, they cry,
Which all things else exceeds.

No gee-gee for the motor cars,
No corn nor hay to find,
Those brilliant stars, the motor cars,
They satisfy the mind.

'Buses and cabs that horses kill,
Driven and whip'd with thong,
The motors will their places fill,
And sweetly glide along.

The motor car has come to stay
Upon the streets and road,
In grand display they drive away
With every precious load.

The motor car is all the go;
See how they swish along,
While time will show their onward flow
With ringing, cheerful song.
Paul Hann, in The Autocar.

Patents.

Lists of Automobile patents granted during month of January.

- 639,057—Carbureting Lamp. Issued to W. J. Keefe.
- 639,156—Elastic Tire for Automobiles. Issued to A. Ducasble.
- 639,164—Pneumatic Tire. Issued to A. B. Shaw.
- 638,684—Vehicle Tire. Issued to C. T. Adams.
- 638,966—Electrically Propelled Vehicle. Issued to R. M. Hunter.
- 638,859—Switch for Electrically Propelled Vehicles. Issued to P. H. White.
- 31,867—Design for Motor Vehicle Frame. Issued to W. O. Worth.
- 31,946—Design for Driving the Axle for Locomobiles. Issued to F. E. & F. O. Stanley.
- 31,947—Design for Steering Axles for Locomobiles. Issued to F. E. & F. O. Stanley.
- 31,948—Design for Axle Frame for Locomobiles. Issued to F. E. & F. O. Stanley.
- 31,982—Design for Motor Vehicle Frame. Issued to W. O. Worth.
- 31,981—Design for Vehicle Running Frame. Issued to H. M. Pope.
- 640,025—Cyclometer. Issued to F. P. Prindle.

- 639,846—Pneumatic Tire Fender. Issued to J. Coon.
- 639,951—Pneumatic Tire. Issued to B. F. Taylor.
- 640,082—Vehicle Tire. Issued to D. E. Bennett.
- 640,007—Vehicle. Issued to F. Menzer.
- 639,302—Hydrocarbon Burner. Issued to J. F. Shultz.
- 639,541—Automobile Vehicle. Issued to F. L. & L. H. Dyer.
- 639,336—An Improved Carbureter. Issued to W. J. Anson.
- 639,481—Carbureter. Issued to H. Wolpert.
- 640,695—Carbureter. Issued to E. D. Parrott.
- 640,299—Means for Supporting Vehicle Frames. Issued to C. L. Merkel.
- 640,641—Vehicle Running Gear. Issued to E. Engelmann.
- 640,522—Transmission Gear for Self-Propelled Vehicles. Issued to W. Baines.
- 641,404—Automobile or Motor Vehicle. Issued to W. E. Pearson.
- 641,558—Burner Using Hydrocarbons. Issued to S. Spillers.
- 641,659—Explosive Motor. Issued to G. A. Tuerk.
- 641,313—Self-Propelled Vehicle. Issued to A. J. Martin.
- 641,511—Driving and Steering Mechanism for Automobiles. Issued to Hildebrandt and McMullin.
- 641,514—An Automobile. Issued to C. W. Hunt.
- 641,603—An Electric Automobile. Issued to Newman & Ledwinka.

The Anglo-American Rapid Vehicle Co.

This company is one of the latest to enter the automobile industry in this country. Rumors of a seventy-five million corporation have been about for several months, but it was not until recently that the men back of this enterprise made themselves known. Among them are noted the names of W. W. Gibbs, who has been prominently connected with storage battery and electrical vehicle interests, and F. D. Carley, who has been connected with Standard Oil interests.

It is a consolidation of several large and important motor vehicle interests, and has acquired the patents formerly owned by the following companies: Pennington Motor Company, Ltd.; Motor Cycle Company of America; British Motor Company, Ltd.; Pennington Foreign Patents Syndicate, Ltd.; Daimler Motor Coupé Company; E. J. Pennington, H. J. Lawson, and other inventors. Over two hundred patents are included in this list, covering oil, electric and steam systems, besides many valuable additional improvements in transmission gears, steering devices, exhaust silencers, carriage frames, and automobile accessories, for which provisional protection has been obtained not only in the United States, but all European countries, India, Australia, South Africa, the Argentine Republic, etc.

The company has just leased the spacious stores, corner 27th street and Fifth avenue, New York, and will have a complete line of vehicles, from the smallest tricycle to the largest omnibus, on exhibition within the near future.

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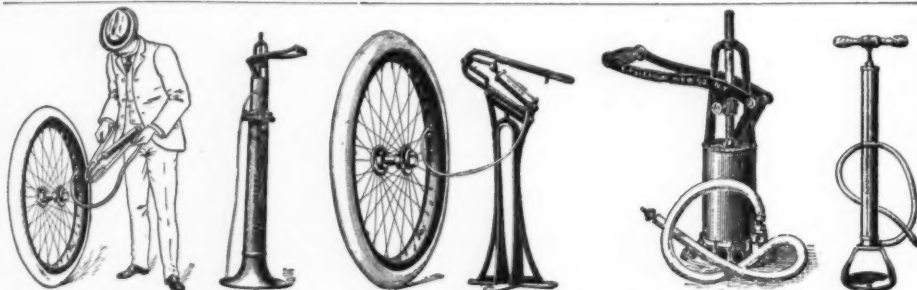
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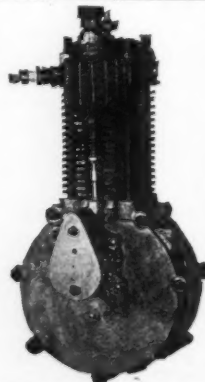
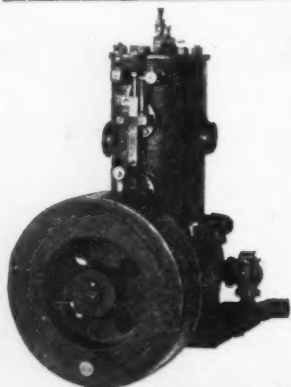
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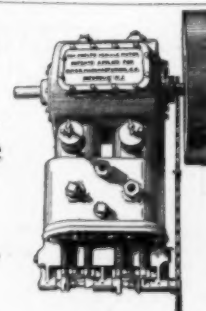
See Exhibit at Cycle Show



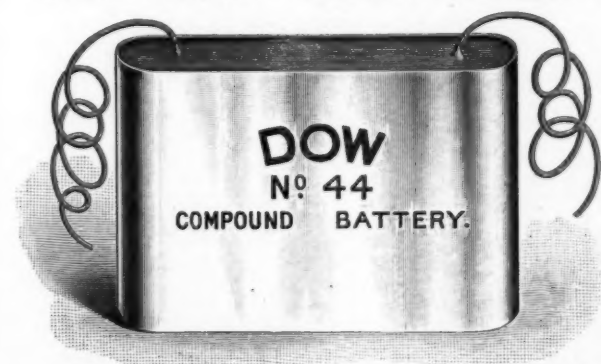
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